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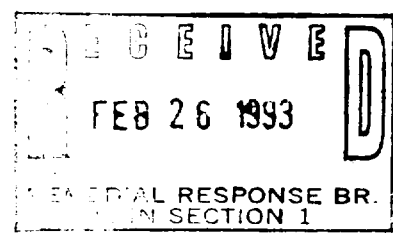
BEFORE THE UNITED STATES  
ENVIROMENTAL PROTECTION AGENCY  
REGION 5

COMMENTS OF KERR-McGEE CHEMICAL CORPORATION  
ON THE FOCUSED RISK ASSESSMENT FOR  
WEST CHICAGO VICINITY PROPERTIES  
AND THE ASSOCIATED FACT SHEET

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February 25, 1993



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These comments are submitted by Kerr-McGee Chemical Corporation ("Kerr-McGee") on the Focused Risk Assessment for West Chicago Vicinity Properties (Jan. 1993) (hereinafter "Risk Assessment"), and the associated fact sheet, titled The Results of a Health Risk Study at Properties in the West Chicago Area (Feb. 1993) (hereinafter "Fact Sheet").<sup>1/</sup>

Because of the limited time that EPA has allowed for the preparation of comments, Kerr-McGee will focus on only the most important issues that these documents present.

EPA has explained that the Risk Assessment is intended to provide support for removal actions in the West Chicago area. Fact Sheet, 2, 9. Kerr-McGee strongly supports the prompt excavation of tailings from any highly contaminated properties in the area and the return of that material for storage at the West Chicago Rare Earths Facility (the "Facility"). In fact, Kerr-McGee has sought for several years to obtain authorization to cleanup certain residential properties in the West Chicago area and to return the material to the Facility, but has been prevented from doing so by the City

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<sup>1/</sup> We understand that Kerr-McGee will have an opportunity to submit comments at a later date on various other documents prepared by the U.S. Environmental Protection Agency ("EPA") relating to the West Chicago properties -- most notably the Action Criteria for Kerr-McGee Residential Areas Superfund Site West Chicago, Illinois (Feb. 1993) (hereinafter "Action Criteria") and its associated fact sheet.

of West Chicago and others.<sup>2/</sup> Nonetheless, although Kerr-McGee supports prompt cleanups of any highly contaminated residential properties, we find serious errors in the documents that EPA has prepared to justify its proposed removal program. For reasons that we will explain, we urge EPA to revise the Risk Assessment and the Fact Sheet substantially before they are publicly released.

In Part I of these comments, we discuss the various difficulties with the substance of the Risk Assessment. As will be seen, EPA's estimation of the risks from tailings contamination is seriously overstated. These errors arise from EPA's selection of atypical properties to evaluate, its failure to collect sufficient information to characterize the sites, and from other errors in its assessment.

In Part II, we focus on the failure of the Risk Assessment to serve its intended purpose even if it were technically supportable. The Action Criteria and the associated fact sheet suggest that EPA intends to launch a removal program that will encompass sites with far lesser contamination than those evaluated, including even sites that have been surveyed and cleaned up by Kerr-McGee and the City of West

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<sup>2/</sup> The State of Illinois ("State") has also created an impediment to the accomplishment of removal actions. The State has enacted legislation that, starting in 1994, would impose an annual fee on tailings found at a former milling site of \$2 per cubic foot. Uranium and Thorium Mill Tailings Control Act, Illinois Public Act 87-1024 (1992). Any use of the Facility for storage of wastes from the properties thus might result in severe financial penalties to Kerr-McGee.

Chicago. Because the Risk Assessment provides an overstated estimate of the risk at highly contaminated sites, it can not provide the foundation for removal actions at the far more numerous sites with only minimal contamination.

Finally, in Part III, we provide our suggestions as to the actions that EPA should undertake in response to these comments. We urge EPA to collect further data and to prepare a risk assessment that is scientifically defensible and that relates to EPA's intended removal program.

I. THE RISK ASSESSMENT IS SERIOUSLY FLAWED

The National Contingency Plan provides that remedial actions ordinarily are conducted only after the completion of detailed studies that may typically require several years to prepare. See 40 C.F.R. §§ 300.430, 300.435 (1992). EPA is authorized, however, to undertake "removal actions" without the delay incident to such studies in circumstances where there is a "threat to the public health or welfare or the environment." Id. § 300.415(b)(1). EPA has explicitly stated that it contemplates removal actions at certain of the West Chicago properties -- the excavation of tailings and their return to the Facility -- and the Risk Assessment is clearly intended to provide a justification for such actions. Fact Sheet, 2, 9. The Risk Assessment serves this purpose because it purports to show that excavation of contamination from certain properties and return of that material to the Facility for storage can serve significantly to reduce risks.

Although Kerr-McGee agrees that the return of tailings to the Facility could result in some reduction in calculated risks, we believe the Risk Assessment serves needlessly to exaggerate the risks associated with the present disposition of the material. EPA concludes that the present risk of cancer incidence associated with the residential sites may be "about 1 in 1000" (Risk Assessment, iii), and that the future risks at these sites may range up to 9 per 100 (id.). As will be seen, these estimates are unrealistically large and may cause significant and unwarranted public alarm in the West Chicago area. Although we agree with EPA that it is desirable to commence promptly with certain removal actions, a study that exaggerates the risks could have serious and unfortunate adverse consequences.

We note at the outset that the Risk Assessment is only one of several studies of the risks associated with the off-site materials. In 1977-78, the Argonne National Laboratory conducted a study of off-site contamination in West Chicago -- a study that was founded on far more extensive data than the Risk Assessment -- and concluded that "there is no hazard to the public health and safety."<sup>3/</sup> Indeed, even EPA

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<sup>3/</sup> Frigerio, et al., Thorium Residuals in West Chicago, Illinois, 25 (Argonne National Laboratories) (NUREG/CR-0413, ANL/ES-67) (Sept. 1978); see also U.S. Nuclear Regulatory Commission ("NRC"), Radiological Survey of the Reed-Keppler Park Site, West Chicago, Illinois, (NUREG/CR-3035) (Nov. 1982) ("off-site deposits [in Reed-Keppler Park] do not present a significant radiological hazard to the public at this time."); Memorandum from W.B. Grant, NRC, to NRC Region III Files (Oct. (continued...))

in the past has stated that the risks to the residents of the area are insignificant. A letter from an EPA official stated that "the data [relating to radiation exposures] showed results that would be expected for ordinary homes in uncontaminated areas."<sup>4/</sup> In short, there is a striking inconsistency between the conclusions of the Risk Assessment and the conclusions of the numerous studies that have preceded it.

The reasons for this discrepancy between the Risk Assessment and the previous studies are twofold. First, the Risk Assessment is misleading because of the inadequacy of the data on which EPA has relied. Second, even if the data had been adequate, the Risk Assessment contains a variety of other errors and incorrect assumptions.

A. The Data on Which EPA Relies Are Inadequate.

The Risk Assessment is fundamentally flawed because the properties that were studied are not typical of the area and because the characterization of the sites was inadequate.

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<sup>3/</sup>(...continued)

2, 1979) with attached West Chicago Airborne Thorium Risk Experiment ("the risk of inhalation of airborne activity was insignificant"); Letter from S.G. Burns, NRC, to N.T. Proto (Sept. 14, 1984) (advising residents on properties near Kress Creek that "there is [no] immediate, serious threat to the health and safety . . . from the contamination along Kress Creek").

<sup>4/</sup> Letter from Kerry Street, EPA, to "Residents" of West Chicago (Nov. 23, 1983).

1. The Sites Are Atypical Of  
The West Chicago Area.

The assessment purports to be limited to certain school properties and four residential properties identified by the Illinois Department of Nuclear Safety ("IDNS"). Although EPA is careful at some points to state that its analysis is limited to these properties, the fact remains that the ordinary reader will extrapolate the conclusions to other sites. Indeed, the Fact Sheet candidly acknowledges that the assessment provides an indication of the "general risk range that may be present at these and other contaminated properties." Fact Sheet, 1 (emphasis added). Moreover, the fact sheet associated with the Action Criteria suggests that EPA intends to use the Risk Assessment to justify removal actions at sites very different from those that were assessed. See pp. 22-23, infra.

In light of this fact, there is an initial question whether the sites that were evaluated are in fact representative of the properties in West Chicago on which contamination is found. Kerr-McGee has had extensive experience with the off-site contamination in the area as a result of the cleanup of residential properties in the City of West Chicago in the mid-1980s. That experience shows that the residential properties that are the subject of the Risk Assessment are not typical of contaminated properties in the area. Moreover, and



perhaps even more significant, the properties evaluated in the Risk Assessment can not serve as reasonable examples of properties that have already been surveyed and, as necessary, cleaned up by Kerr-McGee and the City of West Chicago.

Kerr-McGee surveyed some 2,726 properties in the City of West Chicago in the mid-1980s and only 4.3 percent of the properties (117 properties) were found to contain tailings yielding maximum gamma readings exceeding 30  $\mu\text{R/hr}$ . As shown by Table 1, most of the contaminated properties had maximum gamma readings (before removal of contamination) under 50  $\mu\text{R/hr}$ . Only 18 of these properties had gamma readings in excess of 100  $\mu\text{R/hr}$ , and only 5 had readings in excess of 500  $\mu\text{R/hr}$ . Kerr-McGee also has conducted surveys of possibly contaminated properties outside the City of West Chicago. (Based on information provided by the IDNS, Kerr-McGee understands that it surveyed some of the properties included in the Risk Assessment.) As shown by Table 1, most of these DuPage County properties also had gamma readings under 50  $\mu\text{R/hr}$ . By contrast, all the residential properties evaluated by EPA had gamma readings over the 50  $\mu\text{R/hr}$  level. Moreover, the most highly contaminated site evaluated by EPA (Residence 4) was surveyed by Kerr-McGee and is clearly not representative of the residential properties in the area. The Kerr-McGee survey data thus show the anomalous nature of the sites evaluated by the EPA.

Table 1  
Maximum Gamma Exposure Rate  
Residential Properties

	<u>&lt;30 <math>\mu R/hr</math></u>	<u>30-50 <math>\mu R/hr</math></u>	<u>50-100 <math>\mu R/hr</math></u>	<u>101-500 <math>\mu R/hr</math></u>	<u>&gt;500 <math>\mu R/hr</math></u>
1984/ 85 Residential Cleanup	2609	77	22	13	5
DuPage County Properties*	105	20	9	4	1
EPA Risk Assessment	0	0	3	0	2**

\* Excluding Kress Creek Properties

\*\* Residences 4A and 4B

The residential site presenting the most serious risks is reported in the Risk Assessment to have thorium-232 concentrations of 780 pCi/g, and two of the other residential sites are asserted to have thorium-232 concentrations of 490 and 200 pCi/g. These results suggest that EPA has relied on samples that are largely undiluted tailings. EPA then assumes that tailings at these concentrations are found over extensive areas.<sup>5/</sup> Although Kerr-McGee occasionally has encountered small deposits of undiluted tailings that were used as fill by homeowners for small construction projects -- as fill around a septic tank or under a driveway -- Kerr-McGee has never encountered substantial volumes of undiluted tailings in the residential areas.

It thus is apparent that the four residential sites evaluated by EPA are not representative of other contaminated

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<sup>5/</sup> As will be discussed in a moment, the actual gamma readings are flatly inconsistent with EPA's assumptions about the extent of contamination.

properties in the West Chicago area. Indeed, they demonstrably are completely different from the 2,726 properties in the City of West Chicago that have already been surveyed and, as necessary, cleaned up. The extrapolation of the conclusions of the Risk Assessment to other sites is thus completely inappropriate.

2. The Characterization Of The Sites Was Inadequate.

Even if the Risk Assessment were viewed solely as an evaluation of the risk at the specific sites that were studied, the data were inadequate to provide a reliable basis for the calculation of risk.

The starting point for the estimation of risk is, of course, the determination of the relevant site characteristics. The sole data on which EPA relied were the maximum gamma measurement at the designated properties and the limited analysis of a single soil sample that was collected at the point of the maximum gamma measurement. The risk assessment was conducted by assuming that the single gamma measurement and the single soil analysis were characteristic of the entirety of the contaminated area at each site.

These data are clearly too sparse to provide a reliable portrayal of the sites. EPA guidance specifically provides that risks are to be calculated on the basis of the reasonable maximum exposure -- not the maximum detected level of a contaminant at a site. EPA, Risk Assessment Guidance For Superfund Volume I Human Health Evaluation Manual (Part A),

6-19 (Dec. 1989) (EPA/540/1-89/002). And, EPA concedes in the Risk Assessment that the data were too limited to allow accurate characterization. EPA states:

The reality is that it is difficult to characterize contamination with a single sample. Also, only limited analyses were performed on the samples.

Risk Assessment at 3-10; see id. at 2-24.

Because EPA has used single data points -- the maximum measurements -- to describe the entirety of a site, EPA states that the resulting assessment may exaggerate the risks by "up to a factor of three." Id. at 2-25. In light of the way in which tailings were used in West Chicago, however, this estimate of bias is too small.<sup>6/</sup> In fact, there is evidence internal to the Risk Assessment that serves to show that EPA's use of maximum detected values of thorium-232 significantly overstates the extent of contamination and, as a result, the estimate of risk.

The gamma radiation levels and thorium-in-soil concentrations are related to each other -- the thorium causes the increases in gamma levels. Hence, the reasonableness of

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<sup>6/</sup> EPA states that its factor-of-three conservatism is "[b]ased on technical experience." Id. Experience with other waste sites, which frequently deal with contamination that has been spilled or scattered over a site, is not relevant to the disposition of solid, sand-like materials that were used by homeowners as fill in construction projects.

EPA's estimate of the extent and concentration of contamination can be verified by comparing the observed gamma levels with those that would be predicted from EPA's assumed thorium levels. The inconsistency proves that the EPA estimate of the extent of thorium contamination is seriously in error.

For example, the thorium-in-soil concentration at Residence 5 was assumed to be 490 pCi/g over a 2,400 square foot (223-square-meter) source area to a depth of 1 foot. Risk Assessment, Table 2-2. Based on the relationship of 3.05  $\mu\text{R/hr}$  per pCi/g of thorium-232 for an infinite planar source,<sup>7/</sup> a source with the thorium concentration, area, and thickness assumed by EPA would produce a gamma field of more than 1200  $\mu\text{R/hr}$ . Yet, EPA in fact observed a maximum gamma level of 52  $\mu\text{R/hr}$ . The EPA assumptions about the contamination have thus exaggerated the risk arising from a thorium-232 pathway for this property by a factor of roughly 25.<sup>8/</sup>

EPA justifies its failure to collect more data by pointing to the delay that would have been incident to the conduct of a "baseline risk assessment." Fact Sheet, 2. But, Kerr-McGee believes that EPA has created a false dilemma.

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<sup>7/</sup> Ch. M-Hill, Remedial Investigation Report Kerr-McGee Radiation Sites West Chicago, Illinois, App. F at F-1 (Sept. 29, 1986) (hereinafter "REM/FIT").

<sup>8/</sup> The EPA error explains why the gamma risks are so different in present- and future-use scenarios. Risk Assessment, Tables B-7, B-8. The present scenario was constrained by real measurements of gamma exposure, whereas the gamma risk in the future-use scenario was calculated from EPA's unreasonable assumptions about the depth, areal extent, and concentration of thorium.

Sampling efforts far short of those necessary for a full baseline risk assessment would have significantly enhanced the value and reliability of EPA's work. Indeed, the conduct of complete gamma surveys and the collection of samples to define the areal extent, depth, and nature of the contamination on a limited number of sites would have required no more than a few days of effort.<sup>2/</sup> In light of the significant implications of the risk assessment and the clear errors arising from EPA's reliance on inadequate data, EPA should have collected more complete information about the sites.

B. EPA Has Significantly Exaggerated  
The Risk Associated with the Properties.

Wholly apart from the inadequacy of the data on which EPA has relied, there are a variety of serious errors or other problems with the Risk Assessment. As a result, EPA has significantly exaggerated any risk that arises from the presence of radiological materials at the properties.

1. Mischaracterization of the Source.

Because EPA has not collected adequate data to characterize the sites, it has been forced to make assumptions. The effect of these assumptions is to overstate the

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<sup>2/</sup> The Fact Sheet reveals that EPA rejected an offer by the IDNS to conduct additional sampling because "extensive additional data gathering could significantly delay completion of the focused risk assessment and subsequent removal actions." Fact Sheet, at 7. Contrary to EPA's claims, however, the data on which EPA relied were so sparse that even limited further surveying and sampling could have significantly enhanced the reliability of the Risk Assessment. It is simply incorrect to claim that significant time would have been incurred in augmenting the data on which EPA relied.

risk arising from the present land-use scenario, and to exaggerate the risk from the postulated future land-use scenarios even more.

For the present-use scenario, EPA has assumed that the maximum gamma exposure rate observed anywhere on the property can appropriately be used to calculate the external gamma exposure. Because the maximum gamma rate is, by definition, not typical of the property, the calculated external gamma exposure risk is necessarily exaggerated. And, EPA has calculated the internal exposure risk on the assumption that the thorium-232 concentration from a single sample at the point of maximum exposure can be applied to all the contaminated portion of the property. Because that assumption is false -- indeed, it is contrary to the measured gamma rates -- the internal exposure risk calculation from the present-use scenario is grossly overstated.

It is noteworthy that the external gamma exposure risk for the future-use scenarios is in every instance significantly larger than that arising from the present-use scenario, even for the properties that do not presently have any shielding of the tailings. This is the consequence of the fact that the estimation of the future external gamma exposure was not constrained by even the measured maximum gamma rates, but instead was calculated from the estimated depth, areal extent, and concentration of tailings. Risk Assessment, 2-13 to 2-14. Because these estimates are significantly in error,

see p. 11, supra, both the gamma exposure risk and the internal exposure risk for the future-use scenarios are seriously overstated.

## 2. Background Radiation Levels.

Background radiation levels must be determined as to distinguish the risk arising from tailings-related contamination from that arising from naturally occurring or other non-site-related levels of radiation. EPA assumed a natural background for the West Chicago Area of 7  $\mu\text{R/hr}$ . (The Risk Assessment does not cite any source for this estimate.) But various surveys have been conducted to determine the natural background gamma levels in the area and have found values far in excess of those assumed by EPA. Argonne National Laboratory has reported background values ranging from 12 to 36  $\mu\text{R/hr}$ , with about 95% of the values between 14 and 25  $\mu\text{R/hr}$ .<sup>10/</sup> Similarly, the U.S. Nuclear Regulatory Commission ("NRC") has reported a value of 13  $\mu\text{R/hr}$  for Reed-Keppler Park.<sup>11/</sup> EPA's selection of an erroneously low background gamma level serves to overstate the incremental risk resulting from the contamination.

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<sup>10/</sup> Frigerio, et al., Thorium Residuals in West Chicago, Illinois, supra note 3, at 2.

<sup>11/</sup> See, U.S. NRC, Radiological Survey of the Reed Keppler Park Site, West Chicago, Illinois, supra note 3, Table II at 68.



3. Inhalation of Indoor Thoron/Radon.

EPA's estimate of the risks from inhalation of radon and thoron decay products inside homes constructed on contaminated soils is based on several erroneous assumptions.

a. Thoron Daughter Equilibrium Rate.

EPA assumes a three percent equilibrium decay factor for thoron and its daughters. But that factor assumes that the thoron daughters are not removed from the air by mechanisms such as plate-out (electrostatic attraction to walls and other surfaces) or dust deposition (attraction to airborne dust particles). A thoron daughter equilibrium factor that accounts for such physical phenomena is on the order of one percent.<sup>12/</sup>

b. Indoor Radon And Thoron  
Concentration In Air.

EPA assumes the maximum indoor thoron concentration in air from influx of thoron into the crawl space of a home built on contaminated soil would be 0.29 pCi/L of thoron in indoor air per pCi/g of thorium-232. Risk Assessment, App. A, A8. Another EPA contractor has previously determined, however, that the upper bound estimate is more appropriately 0.1 pCi/L per pCi/g of thorium-232.<sup>13/</sup> And, even then, the

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<sup>12/</sup> See W. Jacobi, "Activity and Potential  $\alpha$ -Energy of <sup>222</sup>Radon- and <sup>222</sup>Radon-Daughters in Different Air Atmospheres," 22 Health Physics, 441-50 (May 1972); E. Stranden, "Thoron and Radon Daughters in Different Atmosphere," 38 Health Physics, 777-85 (May 1980).

<sup>13/</sup> See REM/FIT, supra note 7, at 4-39, Table G-2 at App. G-15; id., Table H-1 at App. H-3.

estimate is extremely conservative because EPA has not considered the attenuation of thoron by even a thin layer of overlying clean soil.<sup>14/</sup>

Similarly, EPA assumes a radon indoor concentration of 0.57 pCi/L radon per pCi/g of radium-226. This estimate is also substantially different from the estimate by an EPA contractor of 0.26 pCi/L radon per pCi/g of radium-226.<sup>15/</sup> Again, EPA has failed to explain its departures from the previous (and very conservative) assessment by its contractor.

#### 4. Risk Parameters -- Dose Conversion Factors.

EPA assumes, without support, that "one roentgen equals one rad equals one rem." Risk Assessment, 2-15. A more appropriate roentgen to rem conversion factor would be 0.61, based on the relationship of one roentgen equals 0.87 rad in air, and 1 rad in air equals 0.7 rem whole-body effective dose equivalent. NCRP, Exposure of the Population in the United States and Canada from Natural Background Radiation, 68 (Report No. 94) (1987).

#### 5. Thoron Risk Values.

EPA assumes that the thoron risk value is 180 per million WLM of exposure, or nearly 80% of the risk parameter used for radon. Risk Assessment, 2-14. However, the health

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<sup>14/</sup> See 1 EPA, Final Environmental Impact Statement for Standards for the Control of Byproduct Materials from Uranium Ore Processing (40 C.F.R. 192), 9-14 to -16 (1983) (EPA 520/1-83-008-1) (one inch of overlying soil leads to a reduction of the thoron flux by a factor of roughly 4).

<sup>15/</sup> REM/FIT, supra note 7, App. G, G-15; App. H, H-3.

risk resulting from exposure to a given concentration of thoron daughters in air is between one-third to one-fifth that of radon daughters.<sup>16/</sup> Thus, a more appropriate value for thoron risk would be between 75 and 45 per million WLM of exposure.

#### 6. Exposure Assumptions.

Many of the exposure estimates in the Risk Assessment are based on EPA guidance that, in our view, tends to exaggerate the real-world risk. It is highly unlikely, for example, that any person would in fact spend 18 hours per day, for 50 weeks per year, for 30 years inside a postulated house that is assumed to be built on the most contaminated portions of the properties using a home design that maximizes risk. Moreover, some of the exposure estimates that are unique to the Risk Assessment -- estimates that are not based on EPA guidance documents or that depart from that guidance -- are completely unreasonable.

##### a. Exposure Times.

The assessment of the exposure of students and teachers is premised on gamma exposure from activities outside the school for 2 hours/day (for 39 weeks/year) in the case of

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<sup>16/</sup> See S.D. Schery, "Thoron in the Environment," 40 J. Air Waste Management Ass'n, 493-97 (1990); see also, 1 U.S. EPA, Final Environmental Impact Statement for Standards for the Control of Byproduct Material from Uranium Ore Processing (40 C.F.R. 192), G-8 (Sept. 1983) (EPA 520/1-83-008-1) ("the effective dose equivalent for the thoron decay products is about one-third that of the short-lived radon decay products").

preschool students, and 3 hours/day (for 26 weeks/year) in the case of junior and senior high school students. Risk Assessment, Table 2-1. These estimates for the duration of the daily exposure do not accord with the realities of the climate in West Chicago, which serves to limit outside activities for significant portions of the year. Moreover, it is completely unreasonable to assume that students in junior or senior high school spend such extensive time in the schoolyard, let alone in exactly those portions that happen to be contaminated. The estimate of the duration of the daily exposure of such students is excessive by perhaps a factor of 10.

b. Gardening Scenario.

EPA evaluated an exposure scenario in which extensive gardening is assumed to take place on the residential properties in the contaminated soil. The risk from ingestion of fruits and vegetables in the diet is estimated at levels as high as 8.3 in 10,000 (Residence 4, future land use scenario). Risk Assessment, Table 2.5. The evaluation of the exposure arising from the home-garden scenario include several implausible assumptions that depart from EPA guidance.

EPA includes present- and future-use scenarios that include pathways from ingestion of vegetables and fruit. Risk Assessment, 2-2, 2-12. The vegetable-ingestion scenarios are based on the assumption that 40 percent of the vegetables that are consumed in a year are grown in the contaminated area.

And, although EPA concedes that little if any fruit is grown in the West Chicago area, EPA has assumed that 30 percent of a person's diet of fruit is grown in contaminated soil. In deriving these values, EPA has not taken into account data on consumption of specific homegrown fruits and vegetables in the area and, as such, the EPA estimates are overly conservative. More importantly, EPA has failed to consider that an evaluation of the potential exposure requires detailed information regarding the rates of ingestion of homegrown produce. Consumption rates are influenced by several important factors, including the size of home gardening plots, yield, quality of produce, types of foods grown, length of growing season, and climate. Nonetheless, aside from a modest adjustment based on plot sizes, EPA has not considered any of these important consumption factors.

Demographic and regional factors strongly influence the extent to which home produce is consumed. In fact, EPA guidance shows that homegrown produce is eaten primarily during the late summer and fall months, or about 20 percent of the year. And even for areas that have long harvest periods (which would not be the case in the West Chicago area) or for people who preserve their food, the exposure duration is no greater than 50 percent. EPA, Exposure Factors Handbook, 1-10. Yet, EPA has assumed an exposure duration of 10,500 days in the Risk Assessment (App. B, B-4, Table B-2) -- the entire period of exposure (i.e., 350 days x 30 years). As a

result, the risk pathway from homegrown fruits and vegetables is flatly inconsistent with EPA's own guidance.

c. Soil Ingestion Scenario.

EPA has evaluated a scenario in which residents are assumed to have contact with radiological materials through ingestion of contaminated soils. EPA has calculated risks of as high as 2.5 in 10,000 from this exposure pathway (Residence 4). Risk Assessment, Tables B-7, B-8. But, EPA has assumed that exposure through soil ingestion occurs throughout the year, whereas the cold climate in the West Chicago area would preclude gardening or other yard activities that could lead to ingestion of contaminated soil for significant portions of each year. Moreover, even EPA has conceded that "[g]iven that much of the contaminated material is isolated by overburden, the probability of continuous ingestion of these quantities of contaminated soil is small." Risk Assessment, 2-26. In short, the exposure assumptions applied to this pathway are unjustified.

C. The Errors Have a Cumulative Effect of Grossly Exaggerating the Risk.

The numerous errors and faulty assumptions in the assessment all tend in one direction -- toward the over-estimation of risk. Because each of the errors interacts with the others in a multiplicative fashion, each error serves to magnify the consequences of the others. As a result, EPA has calculated estimates of risk that have no bearing on the real-world situation. Thus, even if EPA were somehow inclined to

justify some of the individual errors on the premise that EPA should be very conservative, the cumulative effect of the numerous errors can not be ignored. The public release of the Risk Assessment would serve to mislead the public and would create needless anxiety and controversy in the local community. As a result, the Risk Assessment should be substantially revised before public release.

II. THE RISK ASSESSMENT IS NOT RELATED TO THE CONTEMPLATED REMOVAL ACTIONS.

EPA has stated that the Risk Assessment is intended to assist in the determination of whether removal actions are appropriate for various contaminated properties. Fact Sheet, at 1. But, as will be seen, the Risk Assessment is entirely disconnected from EPA's plans. It thus cannot serve as the foundation for the actions that EPA contemplates.

EPA's Action Criteria and the associated fact sheet make clear that EPA contemplates removal actions in which the entire West Chicago area will be subject to extensive further surveys to locate properties with contaminated material. Viewed in light of this purpose, the Risk Assessment is inadequate for a variety of reasons.

1. The sites that were evaluated are not representative of the sites that will be subject to the removal actions. As discussed above, the sites that are the subject of the Risk Assessment are not representative of even the original conditions at most contaminated sites. And, the Risk Assessment is wholly inadequate in justifying further excava-

tions at sites that have already been subject to cleanup activities -- sites that no doubt constitute most of the affected sites in the West Chicago area.

The cleanup program in the City of West Chicago in the mid-1980s served to limit the remaining contamination to levels that pose no significant residual risk. Properties that had gamma readings in excess of 30  $\mu$ R/hr were cleaned up until gamma levels of 15  $\mu$ R/hr were achieved. If EPA were to contemplate removal actions at the levels that it has proposed -- outdoor gamma levels to be reduced to background -- properties that have already been excavated and those with contamination below the action level for the Kerr-McGee cleanup program may now be subject to removal actions. Because the past cleanup efforts were extensive -- Kerr-McGee surveyed some 2,726 properties and remediated some 117 properties -- the preponderance of properties that would be subject to removal actions have already been addressed. These sites now have slight contamination in comparison to those that were studied, and hence the Risk Assessment does not provide a fair or accurate evaluation of the risk reduction that would in fact be achieved by the contemplated removal actions.

2. Various aspects of the study do not appropriately relate to a decision on removal actions. Because the residences that were studied in the Risk Assessment will eventually be remediated in any event, the assessment should



appropriately focus on the risk reduction that would be achieved by advancing the time of the response on these properties for a limited period -- roughly, 2 to 3 years. The decision before EPA is whether to remediate the off-site properties now (with the temporary storage of the wastes on the Facility) or to remediate the properties several years from now (with the shipment of the excavated material to an off-site disposal location). In light of this reality, it is entirely inappropriate to conduct the risk assessment on the basis of 30-year exposure to the materials because a removal action would, at most, serve to avoid 2-3 years of exposure. Moreover, the risk assessment should appropriately not include any evaluation of future-use scenarios because EPA is certainly in a position to assure that those scenarios will not come to pass in the limited time before the materials would be excavated in any event.

3. The evaluation of the risks of temporary storage at the site is inappropriate for the removal actions that EPA contemplates. If EPA were to persist in its "action criteria," the volume of material returned to the Facility would be far in excess of the estimates that have been included in the risk assessment.<sup>17/</sup> Perhaps more signifi-

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<sup>17/</sup> This might not have a significant effect on the risks of temporary storage for several reasons. First, as EPA has acknowledged, the increase in volume does not result in a proportional increase in risk. Risk Assessment, 3-18 to 3-19. Second, given the proposed action criteria, most of the removed material will be largely indistinguishable from normal  
(continued...)

cant, EPA has calculated the risk of storage by assuming that the wastes will be placed at a particular location on the Facility and calculating the impact at specified neighboring properties. As it happens, however, the location selected by EPA is not available.<sup>18/</sup> In order to move wastes from the Facility for off-site disposal, Kerr-McGee must construct a loading facility for railcars and that facility will be located on the portion of the site that EPA selected for waste storage. Because the tailings must thus be placed elsewhere for storage, the EPA evaluation of the risks from storage is necessarily inaccurate.

4. The EPA estimation of the risk associated with storage is incomplete. Any tailings that are returned to the Facility for storage must be placed on the ground and then subsequently picked up for loading in railcars for shipment elsewhere for disposal. The storage of the tailings at the Facility thus involves one extra stage of waste handling beyond that associated with the direct placement of excavated wastes on railcars. The evaluation of the risks from the removal actions should thus include the risks to workers and to the public arising from the extra waste handling associated with removal actions.

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<sup>17/</sup>(...continued)

soil in its radioactive content and hence will pose negligible radioactive risk to properties neighboring on the Facility.

<sup>18/</sup> EPA did not consult with Kerr-McGee in its selection of the location on Kerr-McGee's property for storage of the wastes.

Moreover, if EPA were in fact to contemplate the removal program that is described in its Action Criteria, then it is apparent that significant excavation activities would be required on properties with gamma exposure rates that are near, but slightly above background. The risks associated with leaving those materials in place should properly be compared with construction and transportation risks -- both radiological and accident risks -- associated with the removal of the materials to the Facility and their eventual transport to and placement at a disposal site. Kerr-McGee believes that a complete evaluation might well show that the risks to the public are increased by taking further response actions at sites that were subject to the cleanup program undertaken by Kerr-McGee and the City of West Chicago.

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In light of the foregoing, even if the Risk Assessment had provided an accurate evaluation of the properties, it does not provide a foundation for the contemplated removal actions.

### III. NEXT STEPS

It is apparent that the Risk Assessment is seriously flawed. It grossly exaggerates the risks to the local community and thus, if released as a final document, would needlessly serve to create anxiety in the local community. Moreover, as discussed above, it can not serve to justify the removal action that EPA contemplates.

Kerr-McGee recommends that EPA conduct a risk assessment that can serve as a reasonable and scientifically defensible foundation for removal actions. We believe that the numerous deficiencies in the Risk Assessment can be promptly remedied if EPA takes the following steps:

A. Data Collection.

If EPA focuses the removal actions on those properties that have not yet been subject to cleanup, it should select a representative set of unremediated properties for evaluation. (Kerr-McGee has previously provided EPA with survey records of properties in DuPage County that Kerr-McGee believes warrant further study for possible cleanup activities.) EPA then should conduct sufficient surveying and sampling as to allow a fair characterization of the selected sites.

If EPA continues to contemplate removal actions at properties that have already been subject to past cleanup activities, then a representative set of those properties must be evaluated as well. Kerr-McGee believes that a proper study will show that any residual risk at those sites is so small as not to warrant any further response. Obviously, EPA cannot justify removal actions at sites that have already been cleaned up on the basis of studies of sites that have not been cleaned up.

B. Scope of Risk Assessment.

The risk assessment should be focused so that it fairly evaluates issues that bear on the decision of whether to undertake removal actions. As discussed above, the evaluation of unremediated sites should be limited to the study of the risks associated with a delay of cleanup until a response action would otherwise occur. The inclusion of a future-use scenario is inappropriate and misleading under these circumstances.

If EPA in fact continues to contemplate removal actions at properties that have been subject to the past cleanup program, then the Risk Assessment should be expanded to include an evaluation of all the risks associated with further actions. The evaluation should include the radiological and accident risks incident to the excavation, storage, transport, and placement of these materials. These latter risks, which could be avoided if further removal actions were not taken, should be compared with residual risks of leaving any slight remaining contamination in place.

C. Conduct of Risk Assessment.

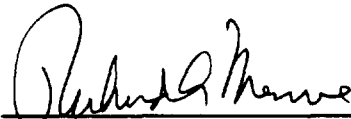
The variety of errors in the current risk assessment should be corrected. As noted above, EPA should correct the significant errors in the characterization of the source, and in the assessment of the various exposure factors and risk parameters.

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Kerr-McGee does not believe that the preparation of a focused risk assessment of the type described above need cause extensive delay. Indeed, the failings of the current assessment are so serious that EPA has no choice, in our view, but to undertake extensive revision of the Risk Assessment. Kerr-McGee is prepared to assist EPA so as to assure that a scientifically defensible study can be expeditiously prepared.

Please contact us if we can provide any further information.

Respectfully submitted,



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DATE: February 25, 1993